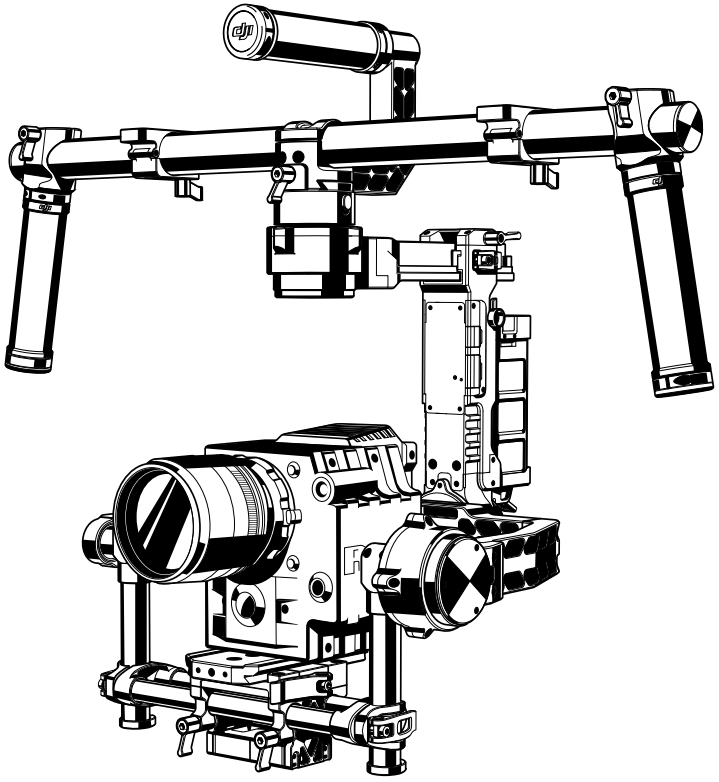
Ronin User Manual

V1.0 2014.07



Disclaimers and Warnings

Congratulations on purchasing your new DJI product. Please read this manual and disclaimer carefully before using this product. By using this product, you hereby agree to this disclaimer and signify that you have read it in full. You agree that you are responsible for your own conduct and any content created while using this product, and for any consequence thereof. You agree to use this product only for purposes that are proper and in accordance with local regulations, terms and any applicable polices and guidelines.

By reading this disclaimer, you also agree:

1. Any part of this disclaimer is subject to change without prior notice. Refer to www.dij.com for the latest version.
2. DJI reserves the right of final interpretation of this disclaimer.

Do not modify or adjust the Ronin.

The Ronin has been calibrated before it leaves the factory. No modification or amending to the Ronin is allowed. Make sure to use the original battery, otherwise performance may be hindered, and internal malfunctions and damage to the gimbal may be caused. Please download the corresponding Assistant software.

As DJI has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. DJI assumes no liability for damage(s) or injuries incurred directly or indirectly from the use of this product.

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Using Lithium Polymer (LiPo) Batteries

LiPo smart batteries can be extremely hazardous and require special attention when handled. Always follow these instructions when using LiPo batteries:

1. DJI smart batteries must be charged with a DJI charger.
2. DJI smart batteries are designed to stop charging when full. However, it is good practice to monitor the charging progress and disconnect the battery from the charger once fully charged.
3. Do not charge a smart battery near flammable materials or on flammable surfaces such as carpet or wood.
4. Never charge a swollen, leaky or damaged battery.
5. Examine charger regularly for damage to the cord, plug, enclosure or other parts. Never use a damaged charger.
6. Disconnect the charger when not in use.
7. Do not clean the charger with denatured alcohol or other flammable solvents.

Usage and Storage

Keep batteries out of the reach of children and pets.

Never discharge batteries below 3V per cell.

Do not heat the battery.

Do not insert or remove batteries if the plastic cover has been torn or compromised in any way.

Do not drop or strike batteries.

Never use a swollen, leaky or damaged battery.

Clean battery terminals with a clean, dry cloth.

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Do not expose batteries to extreme temperatures, including excessive heat. Do not leave the batteries inside vehicles on hot days.
Do not allow batteries to come into contact with any kind of liquid. Do not leave batteries out in the rain or near a source of moisture.
Do not leave batteries in a microwave oven or in a pressurized container.
Do not attempt to dismantle, pierce or cut a battery. Do not attempt to repair batteries yourself.
Do not place loose battery cells on any conductive surface, such as metal-toppled tables.
Do not put the loose cells in a pocket, bag or drawer where they may short-circuit against other items or where battery terminals could be pressed against each other.
Do not place or use batteries on strong electrostatic or electromagnetic surfaces or surrounding areas. This may result in battery damage.
Do not place heavy objects on the batteries or charger. Avoid dropping batteries.
Avoid direct contact with the electrolyte contained within the batteries. The electrolyte and electrolysis vapors are harmful to your health.
Do not mix battery brands inside the controller.
Do not attach the battery to wall or car charger sockets directly. Always use a DJI approved adapter.

Battery Disposal

Discarding batteries in general household waste is bad for the environment. Please dispose of batteries properly.
Do not dispose of batteries in fire.
Damaged or unusable batteries must be disposed of in a container specially reserved for this purpose. When disposing of batteries, follow appropriate local guidelines and regulations. For further information, contact your local solid waste authority or a battery store.
Only use the DJI smart battery.
Always use the DJI smart battery charger.

FCC Compliance

Ronin complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) Ronin may not cause harmful interference, and (2) Ronin accepts any interference received, including interference that may cause undesired operation.

Using this Manual

Legend

Important

Hints and Tips

References or Definitions

Download DJI Ronin Assistant App

Download and install the DJI Ronin Assistant App.
Search "DJI Assistant" on the App Store and then follow the instructions for iOS installation.

iOS6.1 or above

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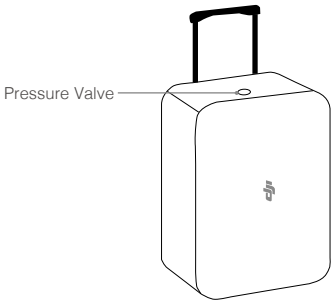
Introduction

The DJI Ronin is the culmination of years of stabilization experience built into our most advanced camera stabilization platform to date. The technology built into the DJI Ronin allows a broad spectrum of cameras varying in size and weight to be mounted for class leading stabilization. We've put years of passion and excitement into the Ronin, bringing world-class movement translation and stability to the professional cinematographer's market.

A brushless gimbal stabilization system is not simply three brushless motors moving on three axes. The motors work with position feedback and the IMU (Inertial Measurement Unit) to communicate with our custom 32-bit processor, which processes movement calculations in milliseconds. This equates to control and stability accuracy down to 0.02 degrees of translated movement, meaning your images are going to be perfectly still in all three axes of movement. There are three operation modes in the Ronin: underslung mode, upright mode and briefcase mode.

Package & Instruction Sheet

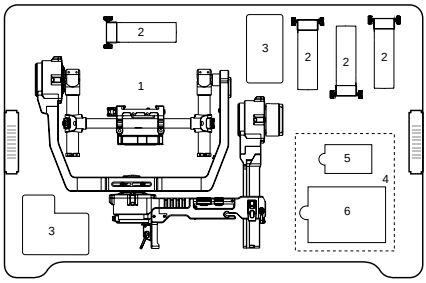
Air pressure may be built up during air transportation or during extreme barometric pressure changes. Loosen the pressure valve knob on the side of the case prior to transportation in these circumstances to prevent pressure build up.



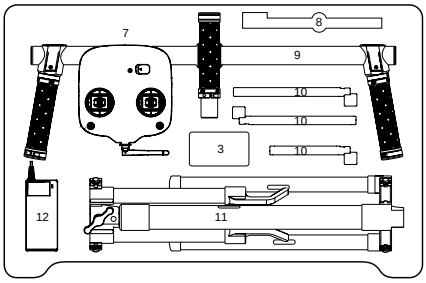
Below is the layout of the items inside the case. Not every item in this sheet is provided by DJI. There are pre-cut slots for some additional accessories. For more information regarding what's included, please refer to the "In the box" section of this manual.

INSTRUCTION SHEET

UPPER LAYER



LOWER LAYER



1 Gimbal
2 Smart Battery
3 Accessories
4 LCD Screen
5 DJI Lightbridge Air System (under the LCD Screen)
6 DJI Lightbridge Ground System (under the LCD Screen)
7 Remote Control -2.4 GHz
8 Adjustable Length Extension Rod
9 Top Handle Bar
10 Camera Mounting Plate
11 Tuning Stand
12 Charger

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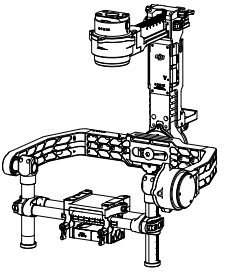
In the Box

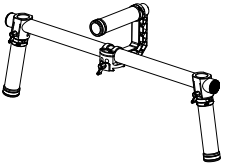
Gimbal × 1

The gimbal includes built-in DJI motor drive modules, an independent IMU module, a 32-bit DSP processor, power supply module, Bluetooth, transmitter/receiver module, camera shelf, and power breakout box.



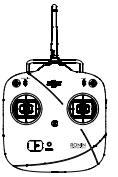
Handle Bar × 1

Customizable handle platform for the gimbal.



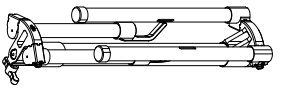
Remote Control -2.4 GHz × 1

Controls the movements of the gimbal, switches the work modes, and selects gimbal speed.



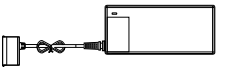
Tuning Stand × 1

For suspending or storing the gimbal.



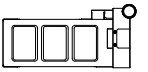
Charger × 1

110-240V automatic switching charger.



Smart Battery × 1

Power source for the gimbal. Also supplies power for other external devices.



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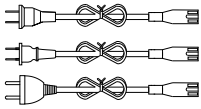
Cables × 3

ANSI & JIS & CE cables.



Plug Adaptors × 2

SAA & BS adaptors.

Micro-USB Cable × 1

For firmware upgrades.

Camera Mounting Plate × 1

For mounting your camera onto the gimbal.

Extension Rod Holder × 1

For installing extension accessories with the extension rods.

Adjustable Length Extension Rod × 6

For installing extension accessories with the extension rod holder.

Accessories Package

Camera Screw A (1/4”) ×2

Camera Screw B (3/8”) ×2

M4*10 Screw ×2

Lens Support Screw ×1

Lens Support ×1

Top Bar Quick Release Accessories Mount x 2

Allen Wrench ×3 (3mm, 4mm, & 3/16”)

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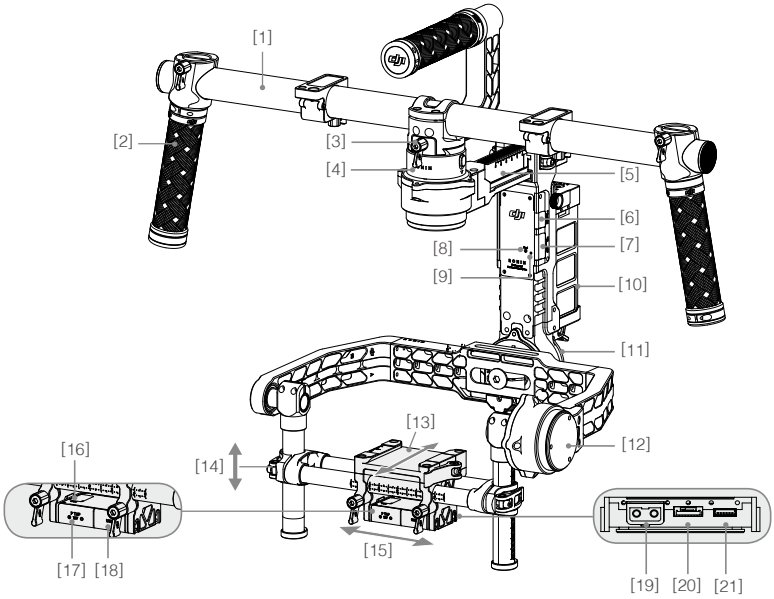
Gimbal Description

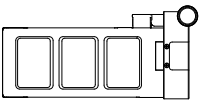


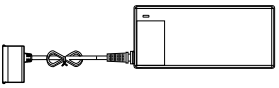
[1] Top Handle Bar
[2] Side Handle
[3] Quick Release Mount
[4] Pan Motor
[5] Pan Adjustment Slider
[6] D-BUS/PPM Receiver Port
[7] USB port & Can Bus Port
[8] Bind Button
[9] Gimbal LED Indicator light
[10] Smart Battery
[11] Roll Motor
[12] Tilt Motor
[13] Fore and Aft Adjustment
[14] Tilt Vertical Adjustment
[15] Roll Adjustment
[16] IMU
[17] P-TAP Accessory Power Port
[18] USB Accessory Power Port
[19] P-TAP Port (rear side)
[20] DJI Lightbridge Port (rear side)
[21] GCU (rear side)

Getting Started

Smart Battery

Before you start using your Ronin, be sure to charge the battery first. The smart battery is specially designed for the Ronin. It has a battery capacity of 3400mAh, voltage of 14.8V, and power management functionality. Charge the smart battery only with DJI approved chargers. When the battery is fully charged, it has a maximum run time of 4 hours.


Smart Battery


Charger

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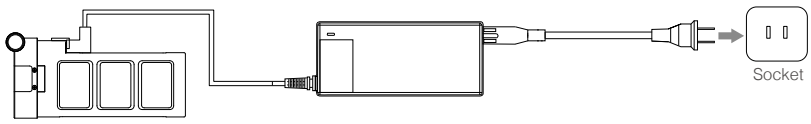
DJI Smart Battery Functions	
Balance Charging	Automatically balances the voltage of each battery cell during charging.
Capacity Display	Displays current battery levels.
Overcharge Protection	Charging stops automatically when the battery voltage reaches 16.8V to prevent overcharge damage.
Over Discharge Protection	Discharging stops automatically when battery voltage reaches 12V to prevent over discharge damage.
Short Circuit Protection	Automatically cuts power supply when a short circuit is detected.
Sleep Protection	Sleep mode is activated after 10 minutes of inactivity to save power.
Charging Temperature Detection	The battery will charge only when the temperature is between 0°C and 55°C.

Battery Specifications	
Type	LiPo
Capacity	14.8V, 3400mAh
Charging Environment Temperature	0°C ~ 45°C
Operating Environment Temperature	-15°C ~ 50°C
Charging/Discharging Environment Relative Humidity	<80%

⚠
- Read the user manual, disclaimer, and battery warnings before use. Users take full responsibility for all operations and usage.
- Always use DJI approved chargers. DJI takes no responsibility for any use of non-DJI approved chargers.

Charging the Smart Battery

1. Connect the charger to a wall socket (100-240V, 50/60Hz), using the plug set if necessary.
2. Connect the battery to the charger.
3. The battery level indicator lights display current capacity level as the battery charges.
4. The battery is fully charged when the battery level indicator lights shut off and the indicator light on the charger turns green. Disconnect the battery from the charger when charging is completed.



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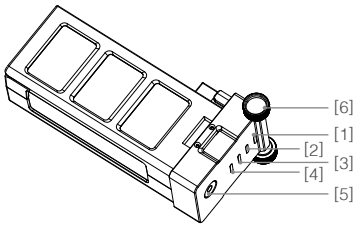
Using the Smart Battery



[1] [2] [3] [4] LED indicator lights
[5] Power Button
(with one LED battery power indicator.)
[6] Thumb Screws

Checking the battery level: When the battery is powered off, pressing the battery power button once will display the current battery level.
Powering on: When the battery is powered off, press and hold for 1 second to turn on the smart battery.
Powering off: When the battery is powered on, press and hold for 1 second to turn off the smart battery.

Description of the Smart Battery Level Indicators

The battery level indicators show the current battery level during both the charging and discharging process. The following is a description of the indicators.

▯: The LED is in a solid state on ▯:The LED is blinking ▯: The LED is off

Discharging process				
LED1	LED2	LED3	LED4	Current battery level
▯	▯	▯	▯	87.5%~100%
▯	▯	▯	▯	75%~87.5%
▯	▯	▯	▯	62.5%~75%
▯	▯	▯	▯	50%~62.5%
▯	▯	▯	▯	37.5%~50%
▯	▯	▯	▯	25%~37.5%
▯	▯	▯	▯	12.5%~25%
▯	▯	▯	▯	0%~12.5%
▯	▯	▯	▯	<0%

Tuning Stand

You can use the tuning stand during setup or for storage of the gimbal. The following steps show how to use the tuning stand.

1. Put the stand in the upright position as shown in the picture below.
2. Put your thumb on the silver button [1]. Using your index and middle finger behind the arm, pull the lower legs outward away from the stand, and then pull downward. Then pull the upper arms outward and upward.
3. The upper half of this tuning stand can be removed by loosening the knob [3]. You can use it with any C-stand style stud that fits the hole [4]. When mounting on to a C-stand, be sure to check the balance of the stand so as to not have the Ronin with a camera tilt over. When setting on a table, make sure the table is a flat and even surface.

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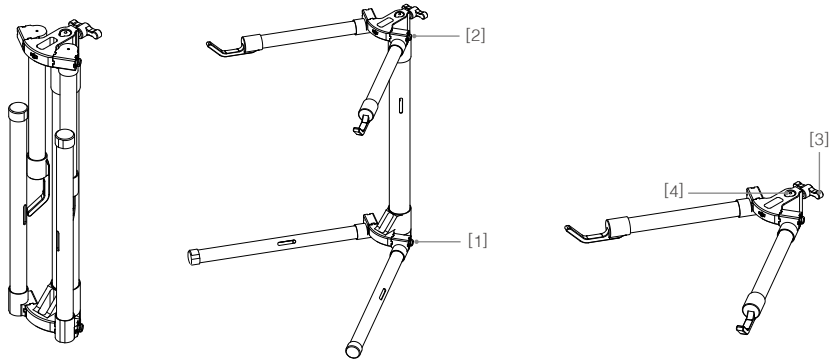
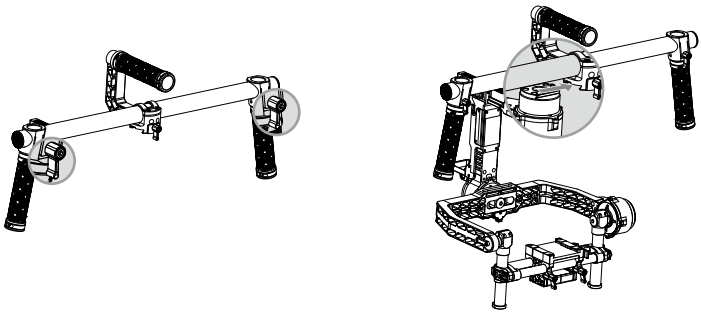
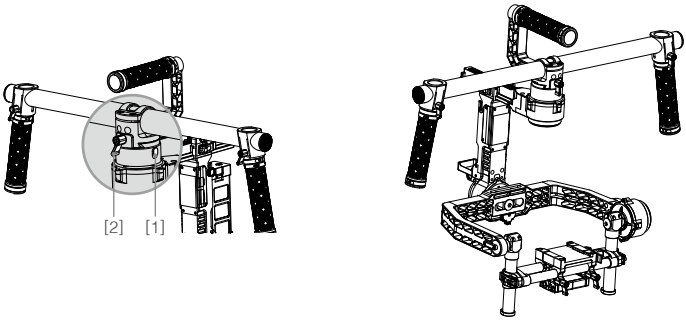


Installing the Handle Bar onto the Gimbal

1. The turn knobs on the handles are loose by default. Adjust the grips to the desired position and tighten the screws to secure their position.
2. Place the handle bar in the position as shown below.



3. Push the lock [1]downward on the pan motor, and slide the handle bar into the gimbal. Then tighten the lock-knob [2].
4. With your hands on the handles, be sure the gimbal is not obstructed during a 360 degree pan. Installation is complete.



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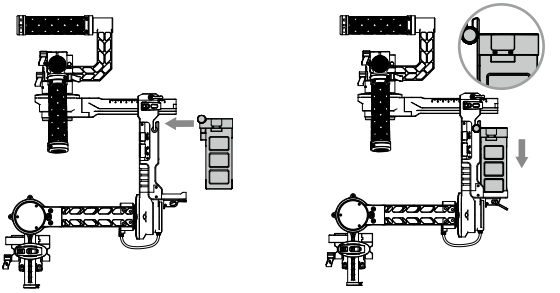
Smart Battery Installation

1. Loosen the thumb screws on either side of the battery. Slide the battery directly into the gimbal and then slide down. Be sure the battery's thumb screws go down into their locating slots making full contact with the gimbal's electrical leads.
2. Tighten the thumb screws on the battery to lock it in place.



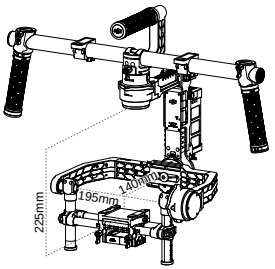
⚠
- Make sure the battery is powered off during the installation.
- An incorrectly installed battery may lead to (1) Poor battery connection, or (2) Unavailable battery information.

Mounting the Camera

The Ronin uses an adjustable camera mounting plate to allow you to easily balance, install and remove your camera. The Ronin has been tested with the following types of cameras. Other cameras similar in size and weight may also work.

Black Magic Cinema Camera	Canon 6D	Nikon D800
Black Magic Pocket Cinema Camera	Canon 7D	Panasonic GH3
Canon 1Dc	Canon C100	Panasonic GH4
Canon 5DMKII	Canon C300	RED Epic/Scarlet
Canon 5DMKIII	Canon C500	Sony NEX7

⚠
- Camera Size Requirements: the maximum depth from the center of gravity on the camera base plate is 140mm; the maximum height measured from the top of the camera base plate is 225mm; and the maximum width is 195mm.As shown in the picture on the right.
- To avoid obstructing camera movement, the use of soft connection cables is recommended.



1. Attach the camera mounting plate to your camera using the provided screws. Choose the correct 1/4" or 3/8" screws. Some cameras have two tripod mounting holes. It's best to secure the camera as tightly as possible. If two mounting holes are available on your camera, then use both mounting holes. Choose the right screw holes according to your camera's configuration.
2. Install the extension rod holder and lens support. Gently push up to apply a little pressure to the lens, then tighten the thumbscrew.

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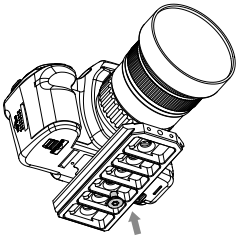
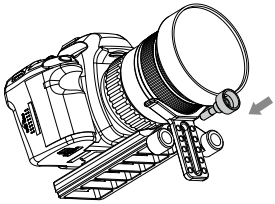
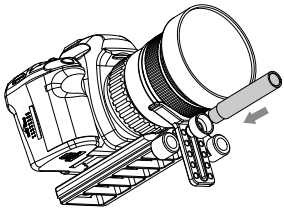


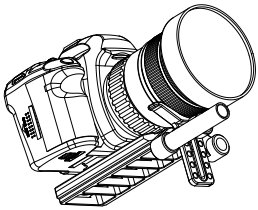


Why do you need to use a lens support?
Certain cameras have a very tight lens securing system, and some cameras like the Canon 5D MKII and MKIII have very loose lens securing systems. The Ronin balances the camera as one solid unit. If the mounted camera has a loose camera securing system, the lens support must be used. This is because if a loose connection between the lens and the camera body is apparent, vibrations could travel through to the camera but not directly to the lens, resulting in the two masses shaking at different frequencies. The resulting oscillation will translate to the IMU, causing the whole gimbal to shake. If the lens support fits, it's best to use it at all times.

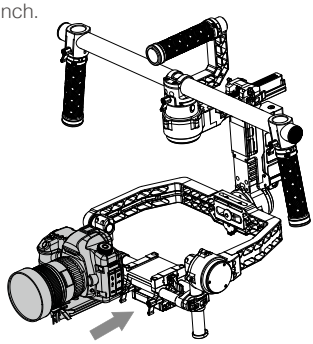
- The lens support can be installed either facing outward or inward to accommodate different lens types.
- Ensure alignment of the camera plate and then tighten the screw prior to tightening the lens support.

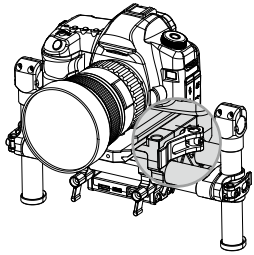
3. If using follow focus or other accessories, insert the extension rod into the extension rod holder and tighten. Configure the length of the rods needs to accommodate for the length of the lens used.





4. With the gimbal on the tuning stand facing outward, insert the camera until the safety lock is engaged. Make sure the gimbal is not turned on when balancing the camera.
5. Tighten the camera base side clamp. You can adjust the tightness of the side clamp with the M3 allen wrench.





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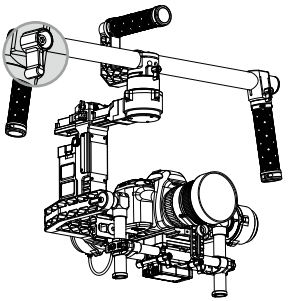
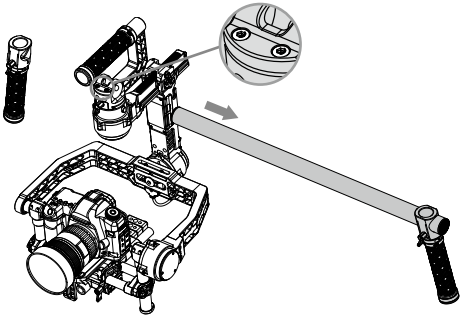
Handle Bar Adjustment

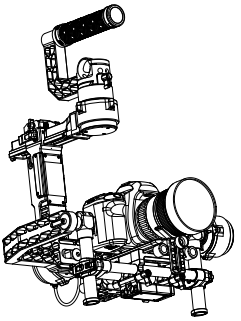
The customizable handle bar of the Ronin can be removed by following the steps below, if required.

1. Loosen screw on either grip.



2. Remove the grip from the handle bar. Loosen the two screws and then the top bar can be removed.
3. The resulting setup is shown below.





Balancing

To achieve the best performance from the Ronin, proper balancing is necessary and a must. Accurate balance is critical in shots where the Ronin will be subjected to extreme movements or accelerations (running, horseback riding, biking, car mounts, helicopters, etc.) Proper balance will also offer a longer battery runtime. There are 3 axes that need to be accurately balanced prior to powering the Ronin on and setting up the software.

⚠ The camera needs to be fully setup with all accessories prior to installing and balancing the camera on the gimbal. If you are balancing the camera with a lens cap on, be sure to remove the lens cap prior to balancing. Be sure whenever balancing the camera that the Ronin's power is turned off.

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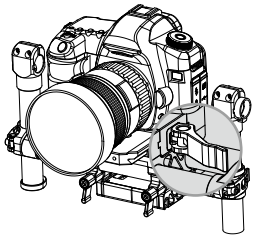
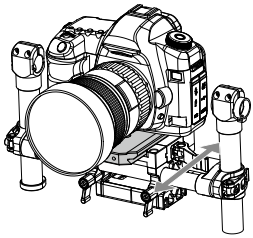
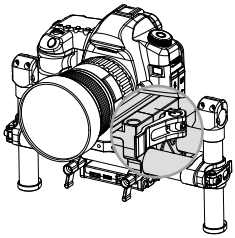
Step 1: Balancing the Tilt Axis

First, we need to balance the camera fore and aft on the Tilt Axis. When the proper fore and aft tilt balance is achieved, the camera will stay level when you remove your hands.

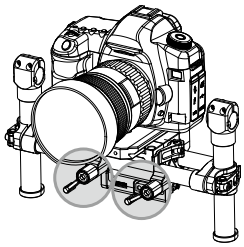
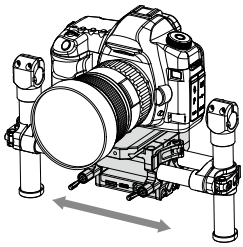
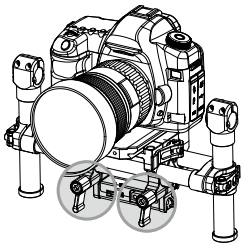
1. Loosen the camera base's side clamp to allow the camera and mounting plate to slide forwards and backwards.
2. Slide the camera forwards or backwards until the Tilt Axis remains level. It takes very small adjustments to get the balance right.
3. Tighten the side clamp to lock the camera and mounting plate in position. If properly balanced, the camera should be able to remain steady in any given tilt angle.

Step 2: Balancing the Roll Axis

Balancing the camera left-to-right on the Roll Axis is also required. When the proper left/right roll balance is achieved, the camera will stay level.

1. Loosen the 2 lock-knobs to allow the camera and mounting plate to slide left and right.
2. Slide the camera left or right until the Roll Axis remains level.
3. Tighten the 2 lock-knobs to lock the camera mounting plate in position.

⚠ When adjusting the roll balancing position of the camera, only loosen the 2 lock-knobs a few turns to allow the camera base to slide. Do not loosen the lock-knobs excessively.

Step 3: Balancing the Vertical Tilt

To adjust the vertical balance, you will need to change the camera's vertical position. When proper balance is achieved, you can rotate the camera to any tilt angle, and it will stay in that position.

Adjust the height of the crossbar to achieve vertical tilt balance.

1. Rotate the Tilt Axis so that the camera lens is pointing skyward as much as your lens setup will allow and loosen the two vertical adjustment tabs.
2. Gently slide the camera mount crossbar forward or backward until the camera remains pointing skyward when released.

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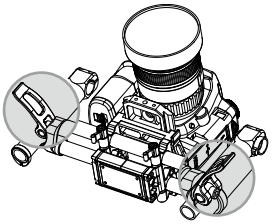
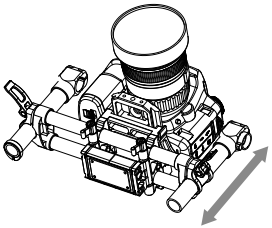
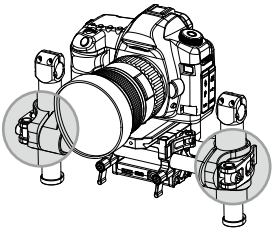
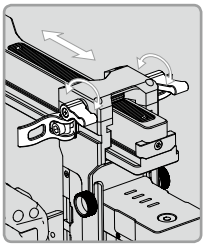
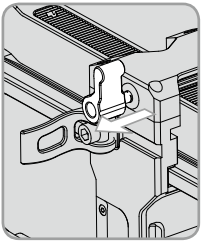
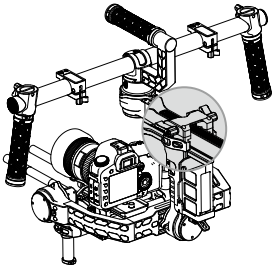
3. Tighten the tabs and be sure the measurement marks match up on either side of the vertical bars. If they do not match up, the assembly could possibly be skewed higher or lower on one side, which would cause the tilt motor to bind. Once the tab is tightened, manually rotate the assembly simulating tilt to ensure there is no binding in the tilt motor. Sometimes you may need to go back and balance the fore and aft tilt axis balance if the vertical balance required a significant change.

Step 4: Balancing the Pan Axis

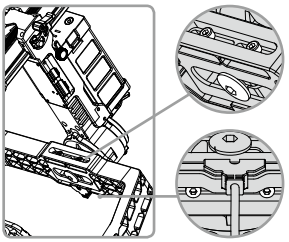
The entire mass below the pan motor must be balanced on the central axis line of the pan motor. To achieve this balance, you must slide the pan axis slider.

1. Loosen the two tabs on the pan axis knuckle and turn the knobs to slide the assembly.
2. Identify if the Ronin is front heavy or rear heavy. Turn the knobs and reposition them by pulling outwards to slide the pan slider forwards or backwards.
3. While the Ronin is resting on the tuning stand, try rotating the Ronin along the pan axis by lifting one side of the handle bar. If the camera does not swing, the pan axis is properly balanced. Ensure you tighten the two tabs after balancing is completed.

Advanced Roll Adjustment

If additional roll adjustment is needed in cases where the camera itself is too light in comparison to the tilt motor assembly, advanced roll adjustment can be achieved by loosening the indicated screws and pushing the assembly to the right or left.



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DJI Ronin Assistant App Tuning

After finishing the balancing portion, you can adjust software parameters through the DJI Assistant App.

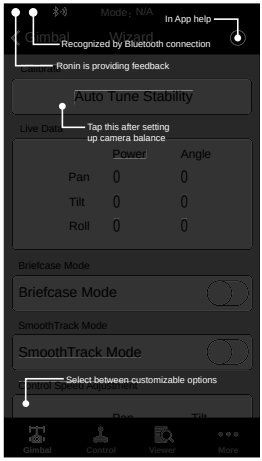
Download and Install

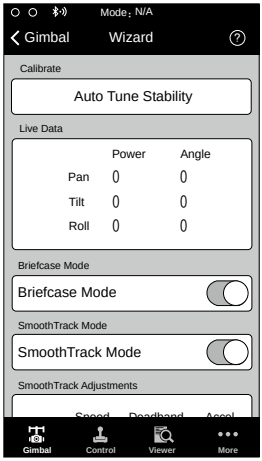
1. Download the DJI Assistant App:
   Search “DJI Assistant” on the App Store then follow instructions for the iOS version.
2. Be sure Bluetooth is switched to the on position on your mobile device. Position the camera in the standard operating position. Power on your Ronin and then open the app to connect to the Ronin via Bluetooth.
3. Register your e-mail address when using the app for the very first time.
4. Connect to your Ronin according to the tips in the app. After connecting to the main controller of the gimbal, you will see the Wizard menu. When the green light at the top in the App is steady and the blue light is blinking, the connection is complete. The green LED light on the Ronin will light up.

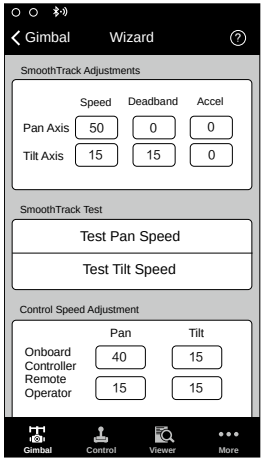
⚠
- After switching on Bluetooth on your mobile device, go back to the Assistant App to connect to the Ronin. The Ronin will not show up in the settings menu of your mobile device. It can only be connected to via the App.
- There are two device types, choose "Ronin" to enter the gimbal assistant page. Choosing "A2" will enter the DJI flight controller assistant page.

Basic Settings

The functionality in the Wizard are the most basic functions you may want to adjust upon receiving your Ronin. These options are also the most used functions during standard operation of the Ronin. You can complete all these settings in the Wizard menu.







1. Calibrate

Auto Tune Stability provides an easy one-touch button for automatic configuration of each axis. Trajectory, speed, power and stiffness of motors are automatically tuned for the camera configuration that’s mounted. Auto Tune Stability should be tapped whenever there is a new camera configuration mounted such as a lens change or accessories change. This will offer the best stability and the most optimal settings.

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2. Live Data

This monitors the feedback from each motor axis. If a particular motor axis indicates a power greater than 10, this often means the mechanical balancing of the camera hasn't been properly adjusted. A properly balanced camera rig will have each axis indicating close to 0 power. Don't worry if these settings are not always 0. The Angle indicates the current angle at which each axis is in relation to center.

3. Briefcase Mode

When Briefcase Mode is switched on, the Ronin will be able to seamlessly transform into this operation mode. With Briefcase Mode turned off, the Ronin will allow the Roll axis to follow if the Ronin is tilted past the standard roll axis travel.

4. SmoothTrack Mode

When SmoothTrack Mode is enabled, the Ronin will can be "steered" by the camera operator's movements in the Pan and Tilt axis. This steering/translation speed can be adjusted for each axis independently. When the Ronin's top bar is rotated left or right, the camera will smoothly pan and slow down to a stop. Under the SmoothTrack options, the Pan Axis and the Tilt Axis can be independently adjusted.

Pan Axis speed will determine how fast the camera will travel while translating a pan movement. Pan deadband will determine how much movement the gimbal will tolerate prior to translating the camera's pan. Tilt Axis speed will determine how fast the camera will travel while translating a tilt movement. Tilt deadband will determine how much movement the gimbal will tolerate prior to translating the camera's tilt.

The Pan and Tilt SmoothTrack speed can be tested. Ensure there is no obstruction of the camera when tapping these Test buttons.

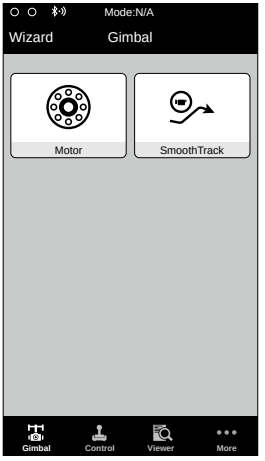
5. Control Speed Adjustment

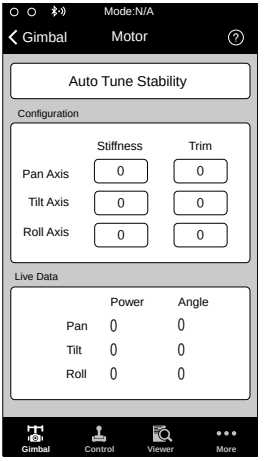
Remote control speed can be adjusted here. The adjustment represents the maximum speed of gimbal control in the Pan and Tilt axis when the control sticks are pushed to their endpoints.

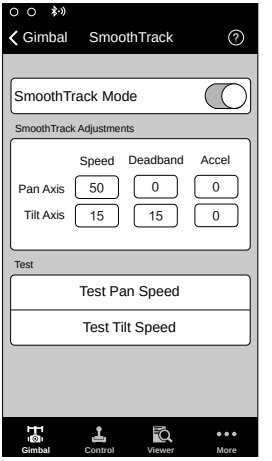
Advanced Settings

There are more advanced functions you can adjust through the Assistant to meet your requirement.

Gimbal Menu







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1. Gimbal Motor Adjustment

The Auto Tune Stability button allows for automatic adjustment of each motor's stiffness settings (as relayed from the sensors and how the Ronin sees each axis's interaction) to accomplish an optimized setting. Besides tuning stiffness, there are other electronic settings being tuned. It is highly recommended that the Auto Tune Stability button be tapped whenever there is a new camera configuration mounted, including a lens change or accessories change. This will offer the best stability and the most optimal settings.

Each axis has its own stiffness and trim adjustment. The motor stiffness adjustment allows fine tuning of the amount of power applied to the motors as they react to the balancing of weight on each axis. The higher you can adjust the stiffness settings without having any vibrations or oscillations from the gimbal, the better. A majority of the time, the Auto Tuned settings will be suitable. The Trim adjustment controls the preset amount of trim applied to each axis off center. The default setting of 0 degrees represents center.

2. Gimbal SmoothTrack Mode

When SmoothTrack Mode is enabled, the Ronin will can be "steered" by the camera operator's movements in the Pan and Tilt axis. This steering/translation speed can be adjusted for each axis independently. When the Ronin's top bar is rotated left or right, the camera will smoothly pan and slow down to a stop. Under the SmoothTrack options, the Pan Axis and the Tilt Axis can be independently adjusted.

Pan Axis speed will determine how fast the camera will travel while translating a pan movement. Pan deadband will determine how much movement the gimbal will tolerate prior to translating the camera's pan.

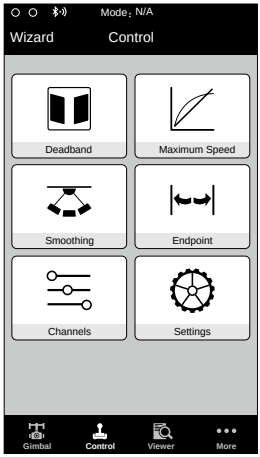
Tilt Axis speed will determine how fast the camera will travel while translating a tilt movement. Tilt deadband will determine how much movement the gimbal will tolerate prior to translating the camera's tilt.

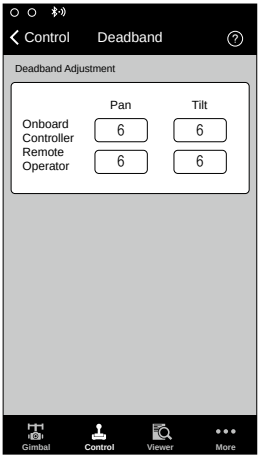
The Pan and Tilt SmoothTrack speed can be tested. Ensure there is no obstruction of the camera when tapping these Test buttons.

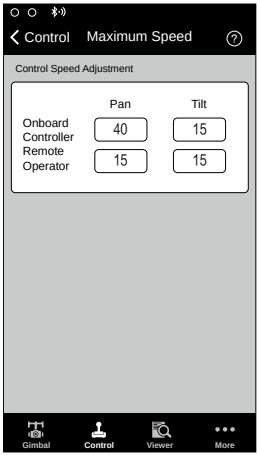
Control Menu

1. Controller Deadband

Onboard controller and the remote operator controller can have independent pan and tilt deadbands of movement. The larger the deadband, the more deadband there is in the stick movement prior to the input being translated to actual movement of the gimbal.







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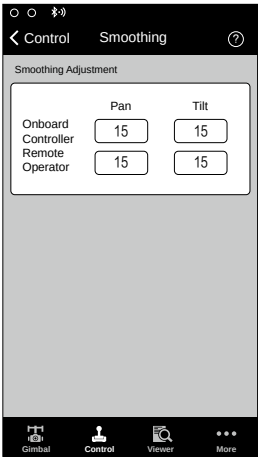
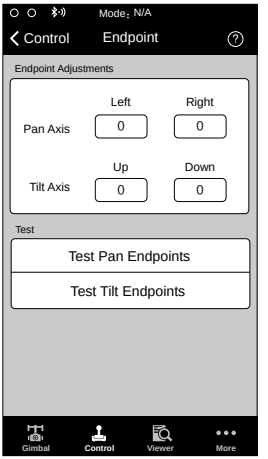
2. Controller Maximum Speed

Maximum Speed is a function that allows the controlled stick response from being a linear response to what is known as an increasing response curve. This means the amount of gimbal travel in the Pan or Tilt is not directly proportional to control stick travel. Control response can be adjusted to be milder below the initial first half of control stick travel and be increased to a higher speed towards the last half of control stick travel. This preset exponential curve is selected based off the input of maximum speed. The onboard controller and the remote operator control sticks can have maximum speeds set independently from each other.





3. Controller Smoothing

When the control stick input is released, the smoothing of the translated movement will come to a smooth slow down if the smoothing is increased. If the smoothing is 0, the slowdown will appear as an abrupt stop. The onboard controller and remote operator control sticks can be set independently. Pan and tilt smoothing can also be set independently.

4. Controller Endpoints Adjustment

Pan Axis endpoints can be adjusted independently for left and right movement when used with a remote control or the onboard controller. Pan Axis endpoints setting means during controller input, the maximum point in which the gimbal will rotate left or right.

If the requirement to rotate 360 degrees on the Pan axis is needed, simply adjust the endpoints for pan to 0. If endpoints are set to 0 for 360 degree Pan ability, then "Test Pan Endpoint" will not move the pan axis.

Tilt Axis endpoints can be adjusted independently for up and down movement when used with a remote control or the onboard controller. Tilt Axis endpoints setting means during controller input, the maximum point in which the gimbal will rotate up or down.

The Pan and Tilt endpoints can be tested. Ensure there is no obstruction of the camera when tapping the Test buttons.

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5. Channels

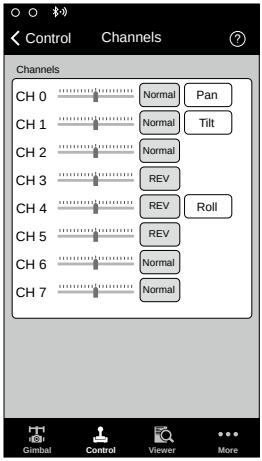
This is a channel indicator to provide feedback during remote operator configuration. Pan, Tilt, and Roll can be re-assigned to either of the remote control sticks. The controlled axis can also be reversed.

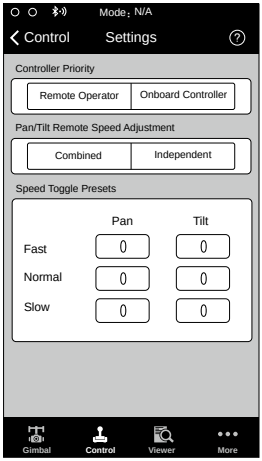
6. Controller Settings

Controller Priority: If both input devices send control signals to the gimbal, the selected controller priority will be the only device to send a signal at that given time.

Pan/Tilt remote speed adjustments can be pre-configured to be selectable on the 2nd operator remote control. The control speed settings for pan and tilt can be set independently from each other.

Setting Speed Toggle Presets, you are setting the Function switch (left switch) on the Ronin remote control. These presets will allow you to change the SmoothTrack speed remotely. If the remote control is turned on, the Speed Toggle Presets for SmoothTrack will take precedence over the App settings. Once the remote control is turned off, the SmoothTrack settings in the App will take over.





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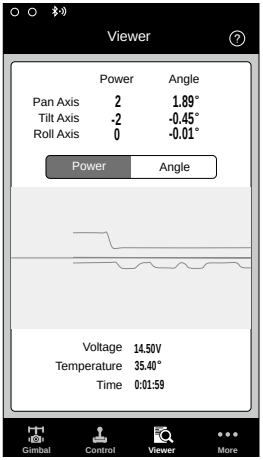
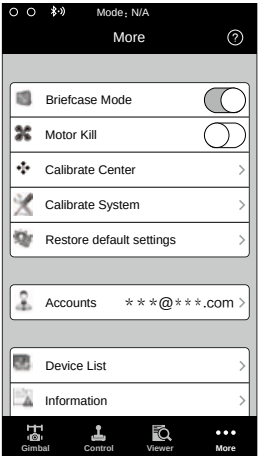
Viewer Menu

The viewer provides all the essential live data for monitoring the gimbals electronics as well as feedback from the motors. Power is indicated for each axis. The current angle of each axis is also indicated. The voltage of the battery, temperature of the main electronics, and also current uptime can also be monitored via this menu.





More Menu

Briefcase Mode

When Briefcase Mode is switched on, the Ronin will be able to seamlessly transform into this operational mode. With Briefcase Mode turned off, the Ronin will continue to allow the Roll axis to follow.

Motor Kill Switch

When activated, the Ronin is still powered on, but the motors will be powered off. This will allow an adjustment to the gimbal or camera without having to turn off the gimbal. Prior to turning off the kill switch, make sure the gimbal is positioned in the standard operating position. The motor kill switch can also be used in case the gimbal operator runs into an issue, or you need to make a quick mechanical adjustment to the gimbal or camera setup.

Calibrate Center

If the Ronin's Pan axis is off center, you can recalibrate the true center of the Ronin using this switch. Using a remote control, position the pan axis at dead center, then tap the Calibrate Center. Tap "Center" again in the pop-up to confirm. Power cycle after calibrating center.

Calibrate System

Calibrate System is only used if you notice any kind of drift in any of the axes. To calibrate the system, place the Ronin on the tuning stand and make sure it is completely steady. Then tap the Calibrate System button and let the process finish before picking up the Ronin.

Restore Default Settings

This will restore all the factory settings that are configurable through the app.

Device List

To force the App to find the Ronin, select "Device List" to force the App to search for Bluetooth devices it recognizes.

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DJI PC Assistant Tuning

You can also tune the Ronin and upgrade firmware through the DJI PC Assistant.

- The tuning abilities of the DJI Assistant App and DJI PC Assistant are the same. There is no need to repeat your settings in both Assistants.
- The DJI Ronin Assistant App and the PC Assistant program cannot be simultaneously launched and connected at the same time. If running the Assistant App on your mobile device, be sure to disconnect the micro USB cable.

Install the DJI WIN Driver and DJI PC Assistant

1. Download the DJI WIN DRIVER INSTALLER from the Ronin product page on DJI.com. Connect the Ronin to your PC via USB cable and be sure the Ronin is powered on prior to installing the DJI WIN Driver.
2. Download the appropriate Assistant installer from DJI.com.
3. Double click the Assistant installer and follow the steps to finish the installation.
4. Run Assistant.
5. Upgrade the firmware or configure parameters using the Assistant as needed.

The Assistant installer can be used on Windows XP, Win7, and Win8 (32 or 64 bit).

Settings

Adjust the following basic functions before using the Ronin: Auto Tune Stability, Briefcase Mode, SmoothTrack and Maximum Speed Adjustment.
The definition and function of every button in the DJI Assistant App and DJI PC Assistant are the same, refer to the DJI Assistant App for more details.

Basic

1. Gimbal

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Motor: The Auto Tune Stability button allows for automatic adjustment of each motor's stiffness settings (as relayed from the sensors and how the Ronin sees each axis's interaction) to accomplish an optimized setting. Each axis has its own stiffness and trim adjustment.

Live Data: This monitors the feedback from the motors on each axis.
Briefcase Mode: Select the checkbox to enable Briefcase Mode.
Motor Kill Switch: Select the checkbox to enable the Motor Kill Switch.
SmoothTrack: Select the checkbox to enable SmoothTrack. Note the Pan Axis and the Tilt Axis can be independently adjusted.
The Pan and Tilt SmoothTrack speed can be tested. Ensure there is no obstruction of the camera when clicking the Test buttons.

Reset Password: If you forgot your Bluetooth connection password, click here to reset your password.
Calibrate Center: If the Ronin's Pan axis is off center, you can recalibrate the true center of the Ronin using this switch. Using a remote control, position the pan axis at dead center, then click the Calibrate Center. Click "Center" again in the pop-up to confirm. Once calibrated, power cycle for the new center to take effect.

Viewer Menu: The Viewer provides essential live data for monitoring the Ronin's electronics and feedback from the motors. Power is indicated for each axis. The current angle of each axis is also indicated.

Calibrate System: Calibrate System is only used if you notice any kind of drift in any of the axes. To calibrate the system, place the Ronin on the tuning stand and make sure it is completely steady. Then click the Calibrate System button and let the process finish before picking up the Ronin.

Auto Tune Stability: The Auto Tune Stability button allows for automatic adjustment of each motor's stiffness settings (as relayed from the sensors and how the Ronin sees each axis's interaction) to accomplish an optimized setting.
Default: Click here to restore all of the factory settings.

2. Control

The onboard controller and the remote operator control sticks have a Deadband, Maximum Speed, and Smoothing, all of which can be set independently.
Endpoint: Pan Axis endpoints can be adjusted independently for left and right movement when used with a remote control or the onboard controller. Tilt Axis endpoints can be adjusted independently for up and down

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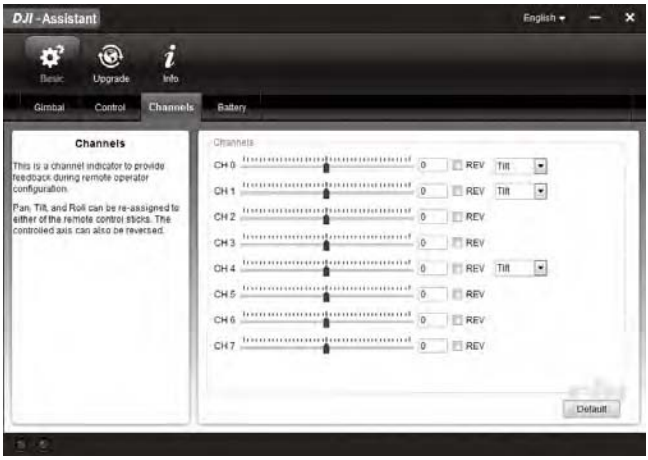
movement when used with a remote control or the onboard controller.
If the requirement to rotate 360 degrees on the Pan axis is needed, simply adjust the endpoints for pan to 0. If endpoints are set to 0 for 360 degree Pan ability, then "Test Pan Endpoint" will not move the pan axis.
The Pan and Tilt endpoints can be tested. Ensure the camera is unobstructed when clicking the Test buttons.
Controller Priority: If both input devices send control signals to the gimbal, the selected controller priority will be the only device to send a signal at that given time.

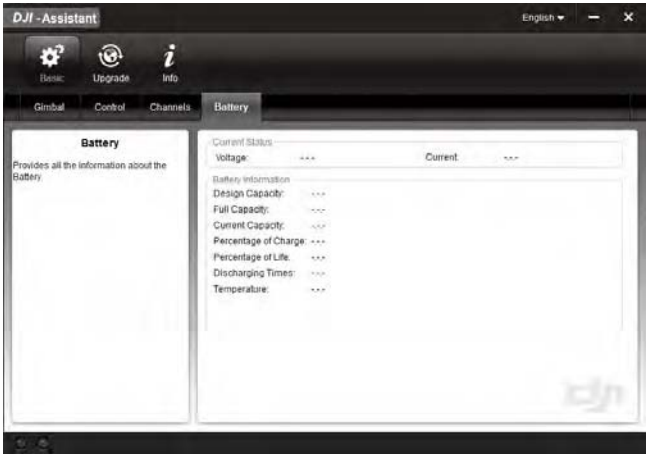
Pan/Tilt Remote Speed Adjustment: Click to choose combined or independent settings.
Speed Toggle Presets: These presets will allow you to change the SmoothTrack speed remotely. If the remote control is turned on, the Speed Toggle Presets for SmoothTrack will take precedence over the Assistant settings. Once the remote control is turned off, the SmoothTrack settings in the Assistant will take over.

3. Channels



This is a channel indicator to provide feedback during remote operator configuration. Pan, Tilt, and Roll can be re-assigned to either of the remote control sticks. The controlled axis can also be reversed.

4. Battery



*This page provides all of the essential information regarding the Ronin's battery.

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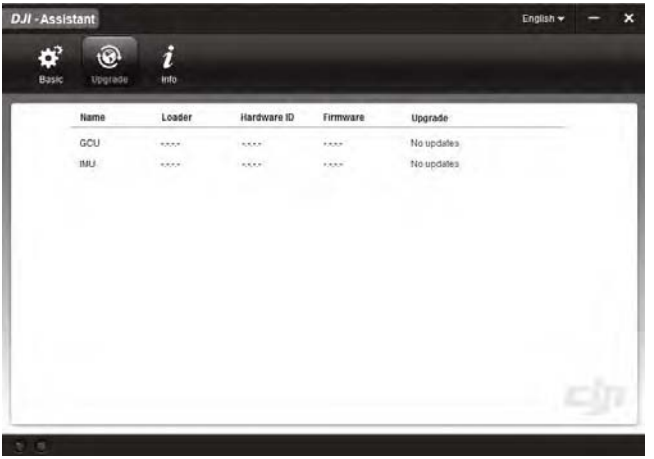
Upgrade



You can view the latest firmware version information on this page. Upgrade the firmware by following the steps below:

1. Connect the Ronin to your computer via the Micro-USB cable and wait until the blue indicator LED in the PC Assistant blinks.
2. Click “Upgrade”.
3. Wait for the download to finish.
4. Click “Upgrade” again and then click “Confirm”.
5. Power the Ronin off and on after the upgrade is complete.

⚠
- Ensure your computer is connected to the internet.
- Close any antivirus programs and network firewalls during the upgrade.
- Ensure the Ronin is powered on during the upgrade.
- Do not disconnect the USB cable during the upgrade.
- Do not power off the Ronin until the upgrade is completed.

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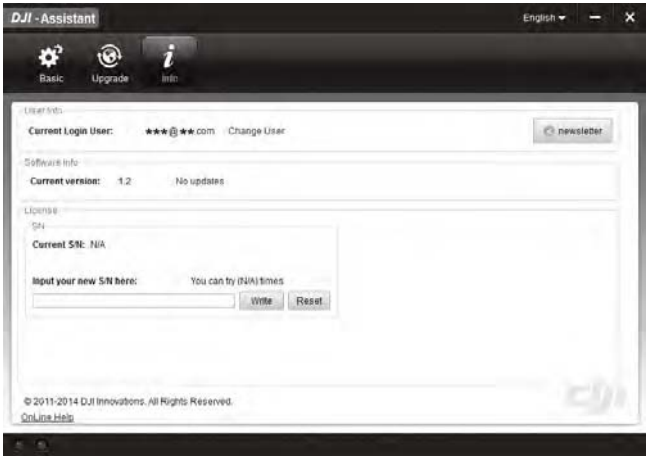
Info



You can check the Assistant version via Info.
S/N is a 32 digit authorization code for future function activations. The authorization code for your unit is filled in after its been manufactured. In the future, you may be asked to fill in a new S/N if you require function upgrades. Fill in the S/N and then click the Write button. If you fill in an invalid S/N more than 30 times, your GCU will be locked and you will have to contact our customer support.

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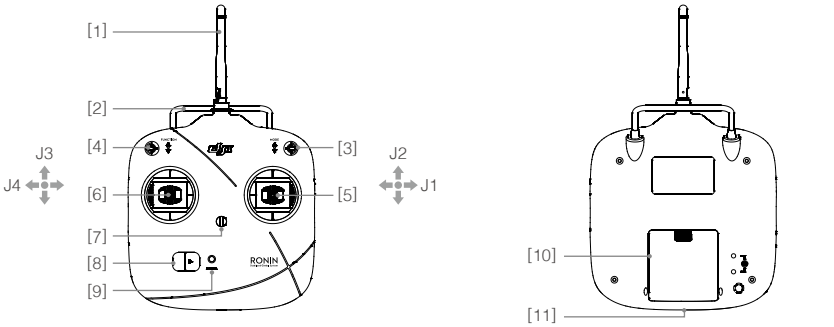
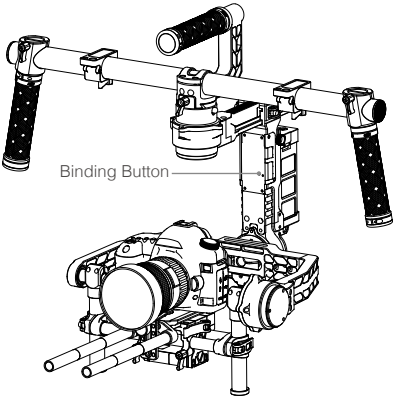
Remote Control



[1] Antenna
[2] Carrying Handle
[3] 3-Position Switch MODE
[4] 3-Position Switch FUNCTION
[5] Joystick 1(J1;J2)
[6] Joystick 2(J3;J4)
[7] Neck Strap Attachment
[8] Power Switch
[9] Power Indicator
[10] Battery Compartment
[11] Micro-USB Port

Connecting the Remote Control to Ronin

1. Insert four AA batteries into the battery compartment on the back of the remote control. Pay attention to the negative and positive poles.
2. Turn on the Ronin, then turn on the Remote Control's power switch. The LED on the Ronin will blink red at this time.
3. Press and hold the Bind button (shown below) for a few seconds until the LED blinks green three times. If the LED changes to a solid, red light, the remote control and the Ronin have been successfully bound. The binding process only needs to be done once unless the bind button is pressed or if the Ronin needs to be bound to another remote control.



⚠
- Please make sure the batteries have enough capacity before use. If the low voltage warning alert sounds, please replace the batteries as soon as possible.
- Use the correct type of battery.
- For long-term storage, remove the batteries from the remote control.

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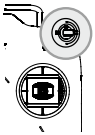
Remote Control Power LED Indicator Status

Power LED Indicator	Sound	Remote Control Status
Ⓡ —— Solid red	None	Normal
Ⓡ ····· Quick Red flashing	B-B-B……	Low voltage alert. It will sound at 4V-4.3V. Replace the batteries immediately.
Ⓡ ····· Slow Red flashing	B--B--B……	Inactivity alert. Will sound after 15 minutes of inactivity. It will stop once you continue using the remote control or turn it off.

⚠ The remote control will automatically power off when the battery voltage drops below 4V.

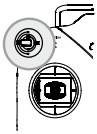
Remote Control Features



MODE: The MODE switch is used for toggling SmoothTrack.

1. In Position 1, SmoothTrack is off. Remote control will freely position pan axis stops and holds the last input position of the pan axis control stick.
2. In Position 2, SmoothTrack is on. Remote control will freely position pan axis stops and holds the last input position of the pan axis control stick.
3. In Position 3, SmoothTrack is on. The gimbal will always point and reset pan to the forward facing direction once the pan axis control stick is let go.

Position 1 -Free, SmoothTrack Off
Position 2 -Free, SmoothTrack On
Position 3 -Reset to Center, SmoothTrack On



FUNCTION: 1. The FUNCTION switch is used to select the SmoothTrack speed. There are 3 possible selections: Fast, Normal and Slow. The value of each speed can be preset in the App or PC Assistant.

Position 1 -Fast Position 2 -Normal Position 3 -Slow

2. Activating Kill Switch.
Quickly flip the FUNCTION switch between Position 1 and Position 3 consecutively for 3 times and you will activate the motor kill switch. Do the same again to turn off the motor kill switch. Prior to re-activating the gimbal motors, be sure to position the camera in the standard operating position. The motor kill switch is useful in case the gimbal operator runs into an issue or you need to make a quick mechanical adjustment to the gimbal or camera setup.

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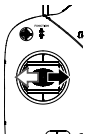
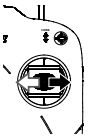
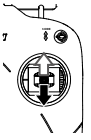
	Left Stick: Horizontal movements on the left stick control the Roll axis. Vertical movements have no definition.		
	Right Stick: Horizontal movements on the right stick control the Pan axis.		Right Stick:Vertical movements on the right stick control the Tilt axis.

These stick settings can be customized in the DJI Ronin Assistant App or PC Assistant.

Adding 3rd Party Transmitter/Receiver

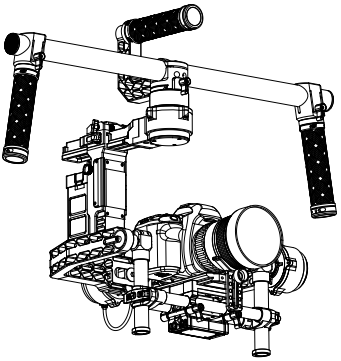
Ronin supports 3rd party transmitters/receivers, such as D-Bus or PPM. Connect the transmitter through the port (refer to Page 8 for the location of D-Bus/PPM port).

Operation Modes

There are three operation modes in the Ronin: underslung mode, upright mode and briefcase mode.

Underslung Mode

Underslung mode is the standard, default mode. It can be used without any user input.



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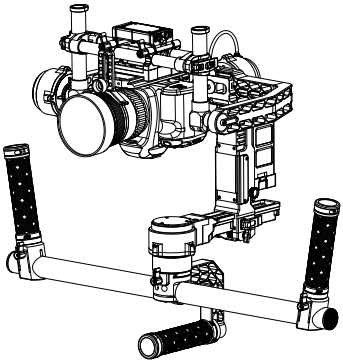
Upright Mode

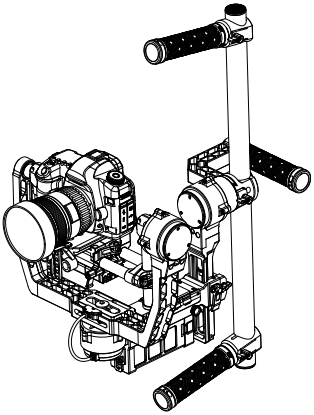
Flip the gimbal forward 180 degrees and it will automatically change to upright mode. Alternatively, you can set the gimbal into upright mode before turning it on. Upright mode is ideal for car mounts or other high camera positions, as it allows you to shoot higher and/or at eye level. Upright mode can be used without any user input. Do not flip the gimbal over sideways going left or right to convert to upright mode.

Briefcase Mode

Briefcase mode allows you to hold the Ronin in a slim profile close to your body. To enter briefcase mode, tilt the gimbal on the roll axis 90 degrees to the left or right. You may turn briefcase mode off in the gimbal app, in which case the Ronin will never automatically transform into briefcase mode. In briefcase mode, the remote control does not have pan or roll control of the Ronin.



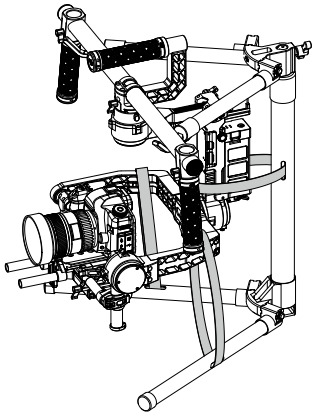
Upright Mode



Briefcase Mode

Maintenance

The figure to the right shows the proper way to transport the Ronin with the stand. Using the hook-and-loop straps, lock the Ronin gimbal in place as shown. Be sure to undo the straps prior to turning the Ronin on!



The Ronin is a precise machine and it is not water resistant. Keep it away from sand and dust during usage. After use, it is recommended to wipe the Ronin down with a soft dry cloth. Never spray any cleaning liquids onto the Ronin.

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Troubleshooting

NO.	The Problem	What to Do
1	Motors appear to be weak	After camera balancing, launch the Assistant App or the PC Assistant and start the Auto Tune Stability. Wait for the process to complete and the stiffness settings will be populated on the screen.
2	If after tapping the Auto Tune Stability button and the gimbal is still vibrating	(1) Check to make sure all knobs are very tight. Including the pan motor knob. (2) Check to make sure the camera securing screw is tight. Push on the camera plate to make sure it is not loose and sliding in the camera mount. (3) Try decreasing the stiffness of the each axis. You should be able to tell if there is one particular axis being affected by looking at the "power" of the axes.
3	Pan axis seems off center	Go into the Assistant App or PC Assistant, tap/click the Calibrate Center and follow the on-screen instructions.
4	Ronin seems to be drifting	Place the Ronin on the tuning stand and in the Assistant App or the PC Assistant, tap/click the Calibrate System button. Let the process complete before picking up the Ronin.
5	SmoothTrack doesn't work	(1) Turn on the Remote control and be sure the MODE switch is not at Position 1 (the uppermost position). (2) SmoothTrack is turned off in the Assistant App or the PC Assistant software. (3) The SmoothTrack Deadband is turned up too high. Reduce the Deadband size in the SmoothTrack Menu.
6	Motors seem to shutoff automatically	Check your camera balance. If the power indicated in the Gimbal Motors Menu indicates 10 or more on any of the 3 axes, please rebalance your camera.
7	Gimbal shuts off and doesn't come back on	Power cycle the gimbal. This is a motor protection algorithm that's built into the Ronin to save its own electronic components. If any particular motor goes into a self protection mode (motor shuts off) 6 times within a 1 minute period, the Ronin will shut off power to the motors and will not come back to life unless power cycled.
8	Forgot the Bluetooth password	Connect Ronin to the PC Assistant and click the "Reset Password" button to reset your password.
9	Footage appears to wobble side to side or up and down	SmoothTrack speed is too high or SmoothTrack deadband is too low. Decrease the SmoothTrack speed or increase the deadband.

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Specification

General		
Built-In Functions	• Three Operation Modes Underslung Mode Upright Mode Briefcase Mode • Built-in independent IMU module • DJI Specialized Gimbal Drive Motors with Encoders	• Bluetooth Module • USB Connection • 2.4GHz Receiver • Temperature Sensor • DJI Advanced 32-Bit DSP Processor • D-Bus/PPM Receiver Supported
Peripheral		
Camera Tray Dimensions	Maximum depth at center of mass on camera base plate: 140mm Maximum height measured from top of camera base plate: 225mm Maximum width: 195mm	
Accessory Power Connections	12V regulated P-Tap x 2, USB 500mW x 1, DJI Lightbridge x 1	
GCU Input Power	4S Ronin Battery	
Connections	2.4GHz Remote Control, Bluetooth, USB	
PC Assistant Software Requirements	Windows XP SP3; Windows 7; Windows 8 (32 or 64 bit)	
Mobile Assistant Software Requirements	iOS version 6.1 or above. Mobile devices: iPhone 4s, iPhone 5, iPhone 5s, iPod touch 5 , iPad 3, iPad 4, iPad mini	
Mechanical & Electrical Characteristics		
Working Current	• Static current: 300mA (@16V) • Dynamic current: 600mA (@16V) • Locked motor current: Max 10A (@16V)	
Operating Temperature	-15°C ~ 50°C (-5°F ~ 120°F)	
Weight	4.20kg (9.26lbs) fully loaded with handlebar	
Gimbal Dimensions	620mm(W) x 280-380mm (D) x 500mm(H)	
Working Performance		
Load Weight Capacity (Reference Value)	7.25kg (16lbs)	
Control Angle Accuracy	0.02°	
Maximum Control Rotation Speed	Pan axis: 90°/sec Tilt axis: 100°/sec Roll axis: 30°/sec	
Control Rotation Range	Pan axis control: 360° Tilt axis control: Up 45° to Down 120° Roll axis control: ± 25°	

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User manual is subject to change without prior notice.

You may visit DJI offical website to obtain the latest version of user manual.

http://www.dji.com/product/ronin/download

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